

January 17, 1856.

Professor WILLIAM ALLEN MILLER, M.D., V.P.,
in the Chair.

The question of Mr. Sievier's readmission into the Society was put to the Ballot, and the Ballot having been taken, Mr. Sievier was declared to be readmitted.

The following communications were read :—

- I. "Anatomical and Physiological Observations on the Organ of Vision, for the purpose of ascertaining the alterations caused by section of the Optic Nerve." By AUGUSTUS WALLER, M.D., F.R.S. Part I. Received January 10, 1856.

(Abstract.)

The author begins by referring to experimental researches already published by him on the effects produced on the nerves of living animals by section at different points in their course; and he briefly recapitulates the chief results of these experiments, as follows, viz.—

1. Section of a spinal nerve on the distal side of its ganglion is followed by degeneration of the part of the nerve beyond the section, whilst the part still connected with the ganglion retains its integrity.
2. Section of the posterior root of a spinal nerve induces no change in the trunk or branches of the nerve beyond the ganglion, nor in the portion of the root which remains connected with the ganglion, whereas the part of the root attached to the spinal cord, but disconnected with the ganglion, becomes disorganized. His conclusion from these experiments, which have been varied in different ways, is "that the spinal ganglion is the centre of the nutritive power of the nerve-fibres adherent to it." From other experiments, he concluded that the anterior spinal roots derive their nutritive influence from the spinal cord; and he has little doubt "that every nerve-fibre is in

connexion with a nerve-cell, which exerts over it a peculiar influence which enables it to retain its structure," &c. He does not think it proved, however, that all ganglia exert an influence both in a central and peripheral direction like those of the posterior spinal roots, and indeed experiments have shown that certain ganglia, such as the superior cervical of the sympathetic, exert their sustaining power on the nerve-fibres connected with them, in one direction only.

The investigation of the effects of section on the optic nerve, which forms the subject of the present communication, promised to yield interesting results on several grounds, and especially as calculated to throw light on the relations of the fibres of the nerve to those of the opposite one in the optic chiasma or commissure, and on the question as to the manner in which they are connected with the brain.

After some observations on the structure of the optic nerve, the author describes his experimental procedure. To see the nerve whilst operating, and thus be assured that the section was effected at the desired point, he began by dislocating the eyeball forwards from its socket, while the animal was under the influence of ether. This operation he found could be effected in the rabbit, by simply pressing the eyelids widely apart, and was unattended with any serious disturbance of the functions of the organ. In dogs the operation is more difficult, and occasions more injurious effects. When the eye is dislocated, its axis is inclined downwards and inwards, and the optic nerve can be reached without difficulty; so that it may readily be cut at any desirable distance behind its place of entrance into the eyeball, and may even by moderate traction be broken off immediately before the chiasma.

After stating various observations which he made on the dislocated eye, the author gives an account of the effects which resulted from section of the optic nerve. The condition of the retina after the operation, was studied during the life of the animal by means of the ophthalmoscope; and, after death, its structure, as well as that of the optic nerve before and behind the place of section, the chiasma, the optic tracts, and connected part of the brain, was examined with the microscope.

The elements of the retina, as well as those of Jacob's membrane, were found unaltered four months after the time of section. The

distal part of the optic nerve (that left in connexion with the eyeball), examined after the lapse of a month in one case, and of two months in another, was also discovered to be unaltered. On the other hand, the part of the nerve behind or on the central side of the section was invariably disorganized. The section was usually performed on the optic nerve of the right eye, and the disorganized fibres of its central segment could be traced back to the left optic tract, through the chiasma, where they obviously decussated with the sound fibres of the opposite nerve. The right optic tract had undergone no change; the fibres of the left tract were disorganized as far back as the quadrigeminate bodies, except those running along the posterior or inner border of the tract; which exception appears to the author to favour the opinion that fibres pass along the tracts and commissures from the quadrigeminate bodies of one side to those of the other side, without connecting themselves with the retina. On the other hand, the results of his experiments do not seem to him to countenance the notion of fibres running in the optic nerves from one retina to the other without connexion with the brain, nor the generally received doctrine that part of the fibres of the optic nerve are continuous with the optic tract of the same side; on the contrary, the whole fibres of the nerve would seem to undergo decussation.

The microscopic characters of the atrophied and disorganized nervous substance are described in the paper; they were found to differ somewhat in the part of the nerve before and that behind the chiasma, owing no doubt to the different structure of these parts in the sound state.

The changes produced in the geniculate and quadrigeminal bodies will be communicated in the succeeding part of the paper.

II. "On some of the Metamorphoses of Naphthalamine." By A. W. HOFMANN, Ph.D., F.R.S. &c. Received January 10, 1856.

The great facility with which some of the nitro-hydrocarbons can be reduced by means of iron and acetic acid—the modification of Zinin's process, lately proposed by M. Béchamp—enables us to